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V. *An Account of a Book, entituled, Consilium Ätiologicum De Casu quodam Epileptico : Quo respondetur Epistolæ Doctiss. Viri Thomæ Hobart, M.D. Annexa disquisitione de Perspirationis Insensibilis Materia, & Peragendæ ratione. Authore Gulielmo Cole, M.D. Coll. Med. Lond. Socio.*

**T**He Author having received a very curious Letter from Dr *Hobart* of *Cambridge*, containing a remarkable Case of a Person, newly become his Patient, afflicted for four years with an *Epilepsy*, on which he requests his opinion, and his thoughts concerning the method of cure, to be used in it ; adding withal several short, but material, remarks concerning the *Inefficacy of Specificks*, the interpolate use of *Purgatives* according to Dr *Sydenham*, &c. Endeavours, in complyance with his desire, first, to give an account of the particular *Seat* of the *Matter of Epilepsies* in the *Brain* ; then to consider the *Method of Cure*, and to answer several questions and doubts hinted in the Letter. The *Seat* he takes (from reasons he alledges) to be the innermost region of the *Cortical* part of it, near where it turns into the *Medullar*, at which place he thinks (according to an Hypothesis he heretofore delivered) the *Nutritious Juice*, newly separated from the *Blood*, but happening to be somewhat more gross than usual, meets with a check, in its progress, on the account of the natural coarctation of the *Vessels* here at their passing into the *Medullar* ; so that, the protrusion being continual, it must undergo some congestion, and in some measure distend this *Repository* ; whereby being of an active nature, it gradually becomes matured into a *Ferment*. This, when it has arrived at a certain degree of *Acrimony*, (partly thence, partly from the distention it makes) breaks forth into the continued channels of the *Medullar* part, and there, by vellicating them, begins those terrible Symptoms of the *Epilepsy*. This matter, as well when so depraved, as naturally, must go forward along the tracts of the *Nerves* and *Fibres*, since it has no other way of exclusion, in which progress it may be presumed to produce variety of Symptoms, on

the account of the different situation of the channels and parts it passes through. And here he makes some kind of parallel between this Distemper and Intermittent Feavers, from a few reasons, to be seen in the discourse it self.

Then he lays down the several administrations, which he conceives it requisite to attempt the Cure by, annexing such reasons of each as appear probable to him: And though, in the first place, he declares he has no great opinion of the vulgar Specificks, (especially till due evacuations are premised) and gives some reasons of the Inefficacy of the Ancient Specificks in our Age, yet he quotes *Mr Boyle* for the efficacy of one, viz. true *Mistletoe of the Oak*, and lays down one instance of the good effect of it, upon his own Experience.

Then he considers the use of Evacuating administrations, as, first, Phlebotomy; then Fontanelles, particularly a Seton; afterwards Purgatives; where he endeavours briefly to justifie *Dr Sydenham's* advice of giving Purgatives in Maniacal affects upon precise days; then mentions, and only mentions here, *Insensible Perspiration*; since he subjoyns a discourse concerning it at the end of this Letter.

Then he proceeds to consider several questions and doubts, which *Dr Hobart's* Letter raises or hints; as first, one Phænomenon concerning the Patients Head growing first hot in the beginning of the Paroxysm, then a coldness seizing him; in a contrary course to that of Intermittent Feavers: Then the use of Tobacco, Stale Beer, but more particularly Sweet smells, which refresht him; where he takes occasion to discuss that question, whether Smelling be performed by an admission of the odorous particles into the olfactory Nerves at their extremities, or only an impreensive on them; and adds withal an attempt at a reason, why sweet smells may be agreeable to *Epileptic* persons (as in the present case) but are apt to occasion *Hysteriek* Fits, though the Symptoms of both these distempers seem to have a great affinity.

Having reply'd to the most material parts of the Letter, he comes to give an account of the Matter and Manner of *Insensible Perspiration*, from an Hypothesis, which he believes to be wholly new, and his own, as not having met with it either in any Author or in discourse. For tho' the celebrated *Sandorius* hath from thirty years observation demonstrated the ~~is~~ of it, without contradiction from any, yet neither he, nor any since, having (so far as this Author has observed) attempted to give a *Rationale* of it, nor distinguish the *Matter* of it from that of *Sweat*, on which distinction

he founds his Notion, he presumes his thoughts on this subject will not be altogether unacceptable.

He takes notice therefore, that 'tis the general opinion, that the Matter of both these evacuations is the same, and that they differ only according to the greater or less proportion of the Matter excluded, and that these persons thence form an Indication of curing most Diseases by Sudorificks. But he being of a very different notion, endeavours to make it out from some considerations and reasons.

And *First*, He considers, that the Matter design'd by Nature to be evacuated at the *pores in the Skin*, is of two sorts, *viz.* Either the superfluous *Serum*, or other Substances which make up the Blood, which, on the account of their Figures and Bulk, when impelled by the Heart, are adapted to pass through duly figured Strainers, which they find there: Or else, the particles of the *Nutritious Juice*, which having either been assimilated, but now become effete, or been brought in a larger quantity than the Nutrition of the part requires, must still go on to the extremities of the Vessels that carry them, till the continued protrusion from above casts them forth.

These two Liquors he takes to be of very different kinds: The *former* consists of very various sorts of particles; the *latter*, tho' not simply homogeneous, yet he supposes to be less heterogeneous than the others: And besides, conceives they must be carried along by very different degrees of motion.

*Secondly*, he considers, That, as these Substances are so very different, so, he thinks, 'tis requisite there should be two different manners of their exclusion; one by means of *Secretion*, the other by a bare *Protrusion*. As to the former, he thinks it probable, that since the particles of the Mass that affords these, *viz.* the Blood, are so very heterogeneous, and this mass so briskly agitated, 'tis necessary a determinate organization and mechanism of some parts should be had to make the Separation; and these parts, where this is effected, we call *Glandules*. As to the latter, it seems obvious, that, supposing there are passages for the conveyance, a simple openness of the Pores at their extremities is sufficient for it.

*Thirdly*, he considers, that 'tis requisite, in order to his explanation, to lay down the *method of Nutrition*, which tho' he hath formerly done, (*Tr. de Feb. Interm.*) yet he thinks it necessary to recapitulate it here, since the main of his Hypothesis depends on it.

Here he, first, summarily gives so many *Requisites* of Nutrition as he thinks sufficient for a foundation. As first, that the part to

be nourished be of such a structure, as easily to admit the Substances to be apposed, and let them pass off when effete. Secondly, that it be bounded; thirdly, that it should have a rectitude of passages; fourthly, that the protrusion of the nutritious Matter should be continual; fifthly, that it should be slow.

Which considerations premised; He thinks, that the former sort of Substances (those of *the Blood*) are the Matter of Sweat, the latter (those of *the Nutritious Juice*) are that of *Insensible Perspiration*; Those to be secreted by the Glandules (as Machins); These excreted by the Fibres (as such) and that by a bare *protrusion* along their tracts.

Yet he thinks not that the whole Matter of Sweat is always only what is sent off by Secretion; no more than he does that upon Insensible Perspiration nothing passes forth but the assigned superfluities of the Nutritious Juice: Since for some reasons he assigns, something may pass out of either of those kinds of Vessels to increase the matter of either evacuation. But he thinks it sufficient to denominate the matter of each from the greater part. Of which more below.

And that the matter in general of these two Evacuations is different, he endeavours to prove by two Arguments.

The *First* is taken from Experience: But he is not so vain to urge his own, but that of *Sanctorius*, whom all learned men value; who from 30 years experience, in a great many of his Aphorisms affirms the wide difference between the effects of these two evacuations.

But because some affirm they have seen considerable and good effects of Sweats in several Diseases, and that others enjoy their health, notwithstanding they frequently and copiously Sweat much, he endeavours in short to answer these objections, as may be seen in the Discourse itself.

His *Second* Argument he takes from the reason and manner of Nutrition: which since some deduce immediately from the Blood, but He himself (as he has formerly endeavoured to prove) from the Nervous Juice; he considers both these suppositions, laying down the manner how either way the business may be presumed to be performed: but more particularly, relying on his own Notion formerly delivered, he gives an abstract of it, and then proceeds to shew, how this Perspiration may be mechanically solved from it, *viz.* supposing that the Brain, and consequently all the Fibres (which make up the whole body; and are, according to him, Vessels) are relaxed in sleep, and so admit the supplements of Nutrition, he infers, that upon waking first the Brain, then the whole

whole Nervous System must fall into contractions, and so protrude what lay before this freshly admitted nutritious Juice, toward the extremities of these Vessels in the surface of the Body, out of which, being continually open, they must pass now plentifully, and thence he accounts for *Sandorius's Perspiratio major* at this time, which done, 'tis obvious it cannot proceed so plentifully all the day, tho' still the protrusion being incessant, some must go forth.

But because he supposes, that both the matter of this Perspiration and Sweat pass forth at *the same Pores* in the Skin, he endeavours to solve this doubt, by considering the *Glandules* (which make up the Skin) either as made up of these Fibres, or as *Secretory Organs*, and supposes, *First*, That what the Fibres, as such, contain, must by the before-mentioned protrusion be continually carried on to their extremities, which lye every where within the cavity off these Glandules, as well as at their surface, and so pass off into those cavities; but *secondly*, In the other consideration these Glandules having a Secretory duct, which all along makes their cavity, the superfluous or much exagitated ferosities of the Blood make their way into the Roots of it, and so must be continually carried on the same way that the other Liquor goes.

But since he believes his *Hypothesis New*, he conceives it requisite to elucidate some things not before sufficiently explained, and therefore endeavours to examine the Source and Nature of this perspirable matter, and to assign briefly the *advantages* of insensible Perspiration, and the *hurt* of immoderate Sweats.

He thinks therefore that the matter of this Perspiration proceeds immediately from *three Springs*, the *Nutritious Juice*, *Blood* and *Solid Parts*. And though he takes the first to afford the far greatest part of this matter, yet he denies not that some part of it may be supply'd by the other two. And first, *The Blood* abounding with great numbers of very subtile particles, and all parts of the Body being porous, 'tis very likely that some will secede at them, but it being both very Heterogeneous, and blended by the violent circulatory motion, and withal much of it fitted to pass off at the Secretory Ducts Nature has framed for that purpose, 'tis but little of it that can pass this way. Then as to the *Solid Parts* These being first made of the Fluids, must as they decay return into them again, and so pass off the same way, that the superfluities of the Nutritious Juice does. But then as to the *Nutritious Juice* it self, which he conceives is carry'd to all parts by the Fibres, he conceives this supplies the great matter of Perspiration; which he endeavours to evince by two Arguments.

First, From the *Plenty* of it, which *Santorius* asserts to be such, that five parts of eight of the aliments which we take in, pass off this way, as his statick Experiment evinces.

The *Plenty* of it he endeavours to prove by the consideration that all our primary Liquors are designed chiefly for Nutrition, and consequently since our bulk is large, and our daily expences great, we need a great quantity of it: Now for the discharge of what has done this Office, Perspiration seems the fittest way, since we are nourished to the very surface of our Bodies, and that by constant Tracts from within.

His second Argument is from the *Utility* of this Perspiration, and the *Inconveniences* proceeding from a stop of it.

The *Utility*, he says, consists in the preservation of Health, and the restitution of it when wanting. Though he appeals for this again to *Santorius*, yet he offers besides, several deductions to prove it. On the contrary, he thinks 'tis obvious, that a *check* of it must be prejudicial.

Here he endeavours to answer an objection raised against the quantity of it, which *Santorius* assigns, from Experience (particularly Sir *John Floyer's*) as supposing that *Santorius* would be understood only of his own Climate *Italy*, or such like. But thinks that, be the quantity greater or less, 'tis sufficiently great to shew we perspire considerably.

He considers also another suggestion, *viz.* That the Blood may be presumed immediately to supply the matter of it. Then he goes about to shew more particularly, wherein the *preservation* of Health, and the *Cure* of Diseases (at least those, which are general, consists. The former he takes principally to be effected by the removal of those Impediments, which would hinder Nature in her regular working. The latter by discharging this way the matter, both *congenit*, and *antecedent* of them already formed, since sooner or later there is little of it but what moves to the circumference.

Of the subject, wherein the matter of these resides, he gives a short Scheme.

But because it may be objected, that all the Diseases touched at, which lye deepest, cannot be carried off by Perspiration; he thinks that even these owing their original to some fault in Perspiration, this ought to be considered, tho' more remotely, as part of the cause, and so being promoted, may carry off some of the Matter. But not designing to discourse of all Diseases particularly, he chooses to range them under that old distinction of *Acute* and *Chronical*, and supposes according to the *vulgar opinion*, that the former may more

more immediately have their seat in the Blood, and the latter in the solid parts, *viz.* the Fibres.

Of Diseases referred to the *Blood* he supposes Feavers to be the most general, tho' withal he reckons all Inflammatory dispositions to belong to this head. Though he think Perspiration more conducive to prevent them than cure them, yet he denies not its use even to this end; for the reasons he in short assigns.

But he supposes its use is greatest in the Cure of *Chronical Distempers*, which he finds in the *Nervous System*. These he considers either as *General*, and affecting the whole body, or as *Particular*, residing in some private part. The former, he conceives, must have their seat in such a place, that they may influence the whole body, *viz.* in the *Nervous System*. And tho' the *Blood* is carried every where, yet being so easily dissipable as 'tis, he thinks it can hardly be the *Seat* of such long distempers; Though the *Jaundice* be an instance on the other side: But he endavours to solve that.

Of these general *Chronical distempers* he mentions only a few of the most remarkable, the very naming of which gives all men an Idea, that they reside in the *nervous System*, and consequently that the Matter may be most readily carried to the circumference of the Body, and so pass out at the pores.

But tho' the diseases of private parts cannot be so cured by reason of their situation, yet he thinks, that part of the antecedent matter of them being carry'd off by Perspiration, the rest will be more easily digested.

Here he takes notice (for the service of the *Fair Sex*) that a duly regulated Perspiration is very conducive both to procure, and continue *Beauty* to a long date, some reasons of which he alledges.

Having thus shwon (tho in short) the *advantages* of Perspiration, he comes likewise to touch upon the *injuries* that *Immoderate Sweating* doth frequently to those who indulge themselves in it.

As, first, the *Blood* is by it robbed of its Serum: 2dly, The intestine motion of it becomes disturbed; 3dly, The tone not only of the Glands, but the whole Body becomes too much intenerated; 4thly, The Secretions in order to Nutrition cannot but be much perturbed by it. Only *Critical Sweats* he thinks are far from being prejudicial, as being of a concocted matter.

But whereas he owns that the Matter of this Perspiration may be thrown off, sometimes by Sweat, sometimes by Urine, and sometimes by Stools; he attempts to solve that difficulty agreeably to the Mechanism of the Body, and native tendency of the Liquors, tho' briefly, as may be seen in the Discourse it self. Then

Then he endeavours to solve another difficulty, raised from the consideration, that the greatest part of the Fibres may be terminated within the Body, and thence to show how these fewer Fibres terminated at the Skin may be sufficient for this evacuation.

That done, he proposes a Paradoxical Problem to be considered, viz. whether all the Fibres in all parts of the Body may not at their terminations naturally form Glandules; and so the whole Body may not be glandulous; and this he doth from three or four considerations.

At last he proposes a method and some means of promoting this Perspiration, when 'tis considerably check'd. And *First* he advises Phlebotomy; *Then* Fasting for a day or two, partly to spend the congested Matter of it, and partly to digest the rest; only he conceives a moderate quantity of thin Liquors useful; and withal thinks, that a quiet compoſure at this time may be most useful to this end. *Thirdly*, He advises the use of a Body-brush every morning for some time. *Fourthly*, if these succeed not, he advises moderate Purging, having first used some Digestives. *Fifthly*, since we abound with Volatile Salts (and perhaps our Animal Spirits are little else) he advises a prudent use of them. *Sixthly*, If yet it proceed not, he advises warm Bathing. But if notwithstanding it proceed not rightly, he proposes, *Seventhly*, the Use of Cold Bathing. Of all which he assigns, in his succinct way, some reasons.

He concludes with alledging the benefit, that he hath found himself by practising it; but would not have any rely on that, but make tryal of it themselves, since 'tis both easie and pleasant; no more going to it, than to lye quiet in Bed, the Hands covered, for half an hour or longer, after full waking resoluing to sleep no more, taking care in the mean time carefully to avoid Sweating, which, tho' it may have its use in some cases, where serosities abound in the Blood, yet is here ordinarily prejudicial, not only in his Opinion, but Experience in himself.

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